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**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

David Roberts MCMURTRY et al.

Group Art Unit: 3662

Application No.: 10/518,918

Examiner: T. BRAINARD

Filed: December 29, 2005

Docket No.: 122070

For: LASER CALIBRATION APPARATUS

**REQUEST FOR RECONSIDERATION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In reply to the September 25, 2008 Office Action, reconsideration of the above-identified application is respectfully requested in light of the following remarks. Claims 26-42 and 44-46 are pending in this application.

The Office Action rejects claims 26, 27, 29, 35 and 36 under 35 U.S.C. §102(b) over U.S. Patent No. 5,056,921 to Chaney. The rejection is respectfully traversed.

Independent claim 26 recites that the displacement of the two or more light beams incident on the at least one detector enables measurement of straightness error in at least one plane and at least one of pitch and yaw during the movement of the first body relative to the second body.

The Office Action, on page 2, asserts that Chaney discloses the above-mentioned features. Applicants respectfully disagree. Chaney discloses an interferometric means for determining movement (interferometry is the technique of diagnosing the properties of two or more waves by studying the pattern of interference created by their superposition). (*See*

Chaney's col. 2, lines 43-46). Therefore, rather than looking at the displacement of a beam on a detector, as recited in independent claim 26, Chaney's system determines if there is any change in the path length of two beams (B1 and B2) and equates the change to determine the movement of the machine (*see* Chaney's Abstract and col. 2, lines 52-56).

Independent claim 26 also recites that the output of one detector is used in the measurement of both: (i) at least one of straightness and roll; and (ii) at least one of pitch and yaw.

The Office Action, on page 2, asserts that Chaney discloses the above-mentioned features. Chaney discloses in the Abstract that the system can measure roll, pitch, yaw, straightness and parallelism of two tracks using a single laser beam. However, it appears from Chaney's disclosure that Chaney's system cannot measure all of the different parameters at the same time from one beam. Instead, Chaney discloses a system that can measure one of the parameters at a time using one beam. For example, in Chaney's col. 2, line 20 - col. 4, line 2, there is disclosed a device for measuring roll using one beam. Furthermore, at Chaney's col. 4, lines 3-14 there is disclosed a modification to the device in order to measure yaw. Specifically, the modification involves the repositioning and reorienting of the device in such a way that the beams B1 and B2 are horizontally displaced as opposed to vertically displaced. However, Applicants note that this arrangement would most likely cause the device to no longer measure roll.

In addition, the fact that the device only measures one of roll, pitch, yaw or straightness at a time is clearly disclosed in Chaney's col. 4, lines 15-34, which explains that "pitching and yawing motions of the vertical column will not affect the path length of the two beams portions being measured ..." and "similarly any unforeseen deviations in the movement of the vertical columns in the x, y and z directions will not affect the path length of differential of the beams." Therefore, Chaney's device is configured to measure only one of

pitch, roll, yaw or straightness, and thus fails to disclose that the output of one detector is used in the measurement of both: (i) at least one of straightness and roll; and (ii) at least one of pitch and yaw, as recited in independent claim 26.

Accordingly, Applicants respectfully request that the rejection be withdrawn.

The Office Action rejects claims 44 and 46 under 35 U.S.C. §103(a) over Chaney in view of U.S. Patent No. 3,552,859 to Snyder. The rejection is respectfully traversed.

Independent claim 44 recites adjusting automatically at least one of a position of the transmitter unit and a movement vector of the second body in response to feedback from the determined position of the light beam on the detector in order to maintain the light beam on the detector during relative movement of the first and second bodies.

The Office Action, on page 5, admits that Chaney fails to disclose the above-mentioned features.

The Office Action, on page 5, asserts that Snyder discloses the above-mentioned features. In particular, the Office Action asserts that Snyder's col. 8, lines 18-64 discloses the above-mentioned features. However, the Office Action is not clear as to which parts of the Snyder's system are considered to be the equivalent of the above-mentioned features. Thus, Applicants respectfully request that the Examiner specifically point out Snyder's equivalent parts to the above-mentioned features if the rejection is to be maintained in a subsequent action. Specifically, Applicants respectfully request that the Examiner point out which parts of Snyder are considered to be equivalent to the first body, the second body, the transmitter unit and the optic unit.

Snyder appears to disclose that it is important to maintain the rotational alignment between two 90° prisms. Snyder's solution for maintaining the rotational alignment involves analyzing the intensity of light falling on a detector 94 and 140 in order to determine relative rotation between the two 90° prisms. (See Snyder's col. 8, line 35 - col. 10, line 10). This is

different from independent claim 44, which recites that there is a determination of the position of a light beam on a detector.

Further, independent claim 44 recites adjusting automatically at least one of a position of the transmitter unit and a movement vector of the second body. However, Snyder discloses adjusting the orientation of one of the prisms. Therefore, Snyder does not disclose adjusting the position of the transmitter unit or a movement vector of a second body, as recited in independent claim 44.

For example, in the currently claimed system it is important to adjust the position of at least one of a position of the transmitter unit and a movement vector of the second body to prevent the beam from falling off the detector during relative movement of the first and second bodies. Also, in embodiments in which the at least one of a position of the transmitter unit and a movement vector of the second body is adjusted to keep the beam on a certain part of the detector, the straightness error can be determined by measuring the amount of adjustment required. On the other hand, Snyder's system is not concerned with either of these problems. Rather, Snyder simply makes sure that the prisms are maintained at a particular angular orientation. Thus, Snyder fails to disclose or suggest the above-mentioned features.

Accordingly, Applicants respectfully request that the rejection be withdrawn.

The Office Action rejects claim 28 under 35 U.S.C. §103(a) over Chaney; claims 30-33, 41 and 42 under 35 U.S.C. §103(a) over Chaney as applied to claim 26 and in view of U.S. Patent No. 4,939,678 to Beckworth; claim 34 under 35 U.S.C. §103(a) over Chaney as applied to claim 26 and in view of U.S. Patent Application Publication No. 2002/0122172 to Ross III et al. (hereinafter "Ross"); claims 37-38 under 35 U.S.C. §103(a) over Chaney as applied to claim 26 and in view of U.S. Patent No. 5,335,548 to Kilibjian; claim 39 under 35 U.S.C. §103(a) over Chaney in view of Kilibjian as applied to claim 38 and further in view of U.S. Patent No. 4,999,618 to Inada; claim 40 under 35 U.S.C. §103(a) over Chaney as applied

to claim 26 in view of U.S. Patent No. 6,343,228 to Qu; and claim 45 under 35 U.S.C. §103(a) over Chaney in view of Snyder as applied to claim 44 and further in view of Beckworth. The rejections are respectfully traversed.

Beckworth, Ross, Kilibjian, Qu and Inada fail to overcome the deficiencies of Chaney and Snyder as mentioned above, with respect to independent claims 26 and 44. Thus, at least in view of the patentably distinct features of independent claims 26 and 44, as well as for the additional features recited in claims 28, 30-34, 37-42 and 45, the rejections of claims 28, 30-34, 37-42 and 45 should be withdrawn.

Accordingly, Applicants respectfully request that the rejections be withdrawn.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.